Pest Management Grants Final Report

Contract# 97-0222

Biologically Integrated Strawberry Systems

Principal Investigator: Larry Whitted
Contractor Organization: Larry Whitted & Associates

April 30, 1999

Prepared for California Department of Pesticide Regulation

DISCLAIMER

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Department of Pesticide Regulation. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

ACKNOWLEDGMENTS

Key personnel associated with the project:

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University of California / Cooperative Extension
Sharon Nance - Rural Sociologist
Chue Yang - Conservationist
USDA/NRCS
Phen Vue - Strawberry Grower

The Biologically Integrated Strawberry Systems (BISS) Advisory Team thanks all the growers who helped make the BISS program a success. They are: Phen and Kay Vue, Va Long Chang, Va Cha Yang, Yee Vang, Neng Fong Cha, Cher Xeng Thao, Ricky Cha, Cha Fong Chang, and the many other interested growers who helped us in our project.

The BISS Advisory Team would also like to extend special thanks to Tria Yang for compiling the information for the database, and Ken Grimes for his assistance in performing soil testing and soils information on the project.

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TABLE OF CONTENTS

Page

ABSTRACT

During its second year the Biologically Integrated Strawberry System (BISS) program utilized the experience and knowledge of a UC farm advisor, a Pest Control Advisor (PCA), a conservationist, a rural sociologist, a soil conservationist, and a grower to refine and demonstrate environmentally sound and profitable production of strawberries in the San Joaquin Valley tailored to the cultural and language needs of Southeast Asian growers. This was accomplished through the recruiting of new grower-participants, expansion of a grower database, soil sampling, two IPM workshops, a financial management workshop, and field monitoring and networking meetings directed toward the proper identification and monitoring of pests, beneficials, diseases, and the safe use of pesticides. Hmong language radio was used to reach growers who were not participants in the project.

EXECUTIVE SUMMARY

There were seven objectives for the BISS program during the second year:

Objective 1

Expand and continue the grower-participant group. Potential grower-participants were identified from the previous year's workshops and from those individuals who have sought out assistance. Thirteen growers will form the core group of grower-participants.

The BISS project ended its first year with six grower-participants. Additional growers were recruited and in the second year thirteen grower-participants were actively involved in the program.

Objective 2

Grower-participants and the Advisory Team will come together for monthly meetings to 1) establish a group identity (cultural key), 2) discuss on-going operations, 3) get information on new pest management methods, and 4) receive mutual support for modifying current practices. This type of regularly scheduled contact is designed to reassure the grower-participants of the commitment of the Advisory Team to them and to the process. Attendance will be tracked and summaries from each meeting developed.

During the first year of the BISS program the monthly meetings were breakfast meetings held at a restaurant in Clovis. At the start of the second year, at the grower=s request, we switched to evening meetings held at a restaurant in Clovis. After holding four monthly evening meetings that were not well attended we decided to hold the monthly meetings in the morning at a different grower=s field each month. Attendance increased dramatically with the new format.

Objective 3

Each grower will be given the opportunity to schedule a comprehensive field evaluation with the Advisory Team. During this evaluation, each grower-participant can discuss the full range of production concerns with this team of agricultural experts. The evaluation will include a discussion of soil testing results. The team will leave the grower-participants a written summary of options to consider. The Advisory Team will submit a summary report of findings and suggestions for the grower-participants' database. This information will be used to track improvements made.

At the monthly grower meetings each grower was offered the opportunity to schedule a comprehensive field evaluation with the advisory team. Four of the growers took advantage of this opportunity.

Objective 4

All acreage in the BISS program will be monitored for two-spotted mites, predatory mites, Gray Mold and Phytophthora. Mites are monitored by taking 50 to 100 leaf samples from throughout the field. If 5 to 10 mites are found per leaf some control action will be recommended. Predatory mites may be released in some of the BISS fields. Due to the successful experience with the trial release of P. persimilis during the first year of BISS, the plan is to expand the program during the second year. Grower-participants will also be instructed on the proper procedure to use for future releases. The monitoring will be conducted by the PCA with either the Conservation Assistant or the Field Assistant, either of whom will provide translation assistance. Monitoring findings will be entered into the database program.

Field monitoring was conducted in all thirteen grower=s fields during the second year of the BISS project. *Botrytis* and two-spotted mite pressure was above average during the spring of 1998. Four growers used predatory mite releases at that time to control mites.

Objective 5

There are two field days planned. The first field day is planned for late June with a focus on soil solarization as a practical alternative to the use of methyl bromide. The second workshop will take place during February. The second part of the all-day workshop will be an afternoon field workshop conducted in one of the grower-participant's field. The focus of the workshop will be on insect and disease monitoring and the safe handling of pesticides. A participant sign-in sheet will be circulated at both workshops. The list will allow us to gauge grower-participant and general public involvement.

The soil solarization workshop was held in July at one of the grower-participant=s fields. Attendees were able to see an example of soil solarization being used prior to strawberry planting. The February workshop was conducted at the Fresno County Cooperative Extension Office. At the workshop Carolyn Watson showed slides of the major pests and beneficial and then distributed hand lenses to the attendees and showed them how to identify mites on leaves that were brought in from a grower-participant=s field.

Objective 6

The majority of Fresno's Southeast Asian strawberry growers are either Mien or Hmong. English is a second language, thus much of agriculture's technical language is difficult to understand. In an effort to address the difficulty surrounding chemical use, a pictorially graphic bilingual fact sheet on Botrytis Rot and Mites was completed during the first year. The one page fact sheet has Botrytis information including pictures of chemical product logos and application do's and don'ts on one side and similar information on mites of the other. An emphasis will be placed on safe use of chemicals. The material will be developed in both languages. Plans include reviewing the old fact sheet, revise if necessary and then circulate to as many growers as possible. Success will be measured by tracking the fact sheet rate of distribution.

The two-spotted mite information sheet was revised and distributed to the growers. The bilingual fact sheet on *Botrytis rot* was also revised.

Objective 7

The Advisory Team will endeavor to demonstrate the economic value of IPM by tracking the costs of production and yields on comparative conventional and IPM plots. The challenge of the objective is not the setting up of the side-by-side plots but the tracking of the costs and yields. Record keeping has been and continues to be one of the greatest challenges faced by this English as a Second language culture.

In the second year of the BISS program a two-evening financial management workshop was held, with an emphasis on the financial aspects of farm management and loan application. Thirty growers attended.

BODY OF REPORT

INTRODUCTION

There are 280 Southeast Asian growers certified by the Fresno County Agricultural Commissioner, the majority of whom operate on tracts of 10 acres or less located near or within the City of Fresno. Strawberry production is labor intensive and usually carried out within families of first generation immigrants whose spoken and written English skills are marginal. Many operators have a limited understanding of the complexities of agricultural chemicals, yet a large number of them sell a percentage of their product in roadside stands. These facts indicate a wide range of potential negative impacts for the growers, their families, Fresno consumers and the natural resources of soil, air and water.

Recognizing the seriousness of these issues, the Natural Resource Conservation Service (NRCS), Fresno Cooperative Extension Service and Whitted & Associates partnered a proposal to the California Department of Pesticide Regulation. The proposal built on the efforts began during a previous year-s project sponsored by NRCS. Strawberry production has become a trademark crop for Valley Southeast Asian growers. If an impact was to be made on Southeast Asian fruit and vegetable production techniques, strawberries was the place to begin.

During the second year of CDPR funding the BISS project reached out to more growers and refined techniques developed during the first year of funding.

MATERIALS AND METHODS

The first year of the project was an introduction to pest identification and pest management practices with an emphasis on the reduction of pesticide use. The identification and use of beneficials to control two spotted spider mites was introduced. Sampling methods for pests, beneficial and diseases were taught. During the second year these concepts were expanded on and soil testing for nitrogen content was included. Grower-participants gained deeper understanding allowing them to become more self-reliant thus enabling them to implement the

practices on their own. Materials used included nitrogen quick test kits, hand lenses, beneficials, a mite brush and microscopes. Methods used to communicate with the group changed frequently. Morning meetings at a grower-participants= field proved more successful than morning or evening meetings at a restaurant. Working with the participants individually rather than in a group produced a better understanding of the information being taught.

RESULTS

This demonstration project has seven objectives that were used to structure our work plan. The objectives of this demonstration project were designed towards an individual approach with the growers. This was accomplished through weekly field visits where the grower learned to sample for various pests. During weekly field visits 50 leaf samples were counted for the presence of two spotted mites and predators. The results were explained to the grower and later compiled with other data to form a booklet of the season=s field activities. Each graph in the booklet charts two-spotted spider mite populations from their first appearance in late April through the completion of crop harvest in June. The graphs also include the presence of beneficials such as six spotted thrips and the release of predatory mites and their effect in controlling two-spotted mite populations. (Fig. 1-13) Once a month the nitrogen level in each field was tested using a nitrogen quick test kit. The soil graphs indicate the amount of nitrogen present in the soil through the crop=s development. (Fig. 13-25) These results are also included in the grower booklet along with the results and an explanation of a comprehensive soil sample taken for each grower-participant. (Table 1a, App. O-P)

DISCUSSION

There were seven objectives used to frame this demonstration project. The importance of this project is highlighted by the fact that no previous formal field projects had been carried out with San Joaquin Valley Southeast Asian strawberry growers. As a result the information found in the following objectives is a first step toward introducing these growers to technical agriculture.

Objective 1

Expand and continue the grower-participant group. Potential grower-participants were identified from the previous year's workshops and from those individuals who have sought out assistance. Thirteen growers will form the core group of grower-participants.

The BISS project ended its first year with 6 grower-participants. This year we had 13 grower-participants.

The thirteen growers in the program this year were: Phen Vue - 6 acres, Va Long Chang - 6 acres, Howard Yang - 8 acres, Yee Vang - 2 acres, Neng Fong Cha - 3 acres, Cher Xeng Thao - 2 acres, Vacha Yang - 3 acres, Gha & Tria Vang - 4 acres, May Sia Thao - 3 acres, Touxia Thao - 3 acres, Ricky Cha - 3 acres, Cha Fong Yang - 6 acres, Thomas Vangyi - 10 acres

Objective 2

Grower-participants and the Advisory Team will come together for monthly meetings to 1) establish a group identity (cultural key), 2) discuss on-going operations, 3) get information on new pest management methods and 4) receive mutual support for modifying current practices. This type of regularly scheduled contact is designed to reassure the grower-participants of the commitment of the Advisory Team to them and to the process. Attendance will be tracked and summaries from each meeting developed.

During the first year of the BISS program the monthly meetings were breakfast meetings held at a restaurant in Clovis. At the start of the second year, per the growers= request, we switched to evening meetings held at a restaurant in Clovis. After holding four monthly evening meetings that were not well attended we decided to hold the monthly meetings in the morning at a different grower=s field each month. Attendance increased dramatically with the new format. Pest management practices were discussed, with an emphasis on the differences required by the increased rainfall in the spring of 1998. The growers and the advisory team also discussed the soil test results.

Objective 3

Each grower will be given the opportunity to schedule a comprehensive field evaluation with the Advisory Team. During this evaluation, each grower-participant can discuss the full range of production concerns with this team of agricultural experts. The evaluation will include a discussion of soil testing results. The team will leave the grower- participants a written summary of options to consider. The Advisory Team will submit a summary report of findings and suggestions for the grower-participants' database. This information will be used to track improvements made.

At the monthly grower meetings each grower was offered the opportunity to schedule a comprehensive field evaluation with the advisory team. Four of the growers took advantage of this opportunity.

Objective 4

All acreage in the BISS program will be monitored for two-spotted mites, predatory mites, Gray Mold and Phytophthora. Mites are monitored by taking 50 to 100 leaf samples from throughout the field. If 5 to 10 mites are found per leaf some control action will be recommended. Predatory mites may be released in some of the BISS fields. Due to the successful experience with the trial release of P. persimilis during the first year of BISS, the plan is to expand the program during the second year. Grower-participants will also be instructed on the proper procedure to use for future releases. The monitoring will be conducted by the PCA with either the Conservation Assistant or the Field Assistant, either of whom will provide translation assistance. Monitoring findings will be entered into the database program.

All acreage in the BISS program was monitored biweekly for two-spotted mites, predatory mites, other beneficials, Gray Mold and Phytophthora. The growers were taught how to monitor and what to look for. Mites were monitored by taking 50 to 100 leaf samples from throughout the field. A copy of the results was given and explained to the grower. Predatory mites were released in some of the BISS fields introducing the grower to their use, except for one grower who had already used them in the past. The same monitoring process was used in all the fields. Graphs and charts were given and explained to all growers. (Fig. 1-13) Copies of all weekly field reports were given to members of the advisory team, the grower and the PCA representing the packinghouse each grower has contracted with to sell his crop. (App. A-D) All the information gathered was entered into a computerized database.

There was a lot of *Botrytis* in the strawberry fields in 1998 due to above average rainfall, and the growers made up to three applications of Rovral. This represents an increase over the amount of fungicide applied in 1997 due to the higher rainfall levels in 1998. During the 1999 growing season fungicide applications have been reduced and less *Botrytis* has been observed because of a relatively dry spring.

Two-spotted spider mite populations were also higher in 1998 than in 1997, which was not expected with the cooler, wetter conditions. Nevertheless, only one of the thirteen growers applied a miticide in 1998. Five of the growers released predatory mites into their fields. In 1999 two-spotted spider mites began to show up early in February in fields using black plastic. Mite populations grew rapidly and six weeks prior to harvest at least two growers required treatment.

Objective 5

There are two field days planned. The first field day is planned for late June with a focus on soil solarization as a practical alternative to the use of methyl bromide. The second workshop will take place during February. The second part of the all-day workshop will be an afternoon field workshop conducted in one of the grower-participant's field. The focus of the workshop will be on insect and disease monitoring and the safe handling of pesticides. A participant sign-in sheet will be circulated at both workshops. The list will allow us to gauge grower-participant and general public involvement.

A field day was held on July 8, which focused on alternatives to methyl bromide. The field day was held at Touxia Thao's field. University of California research has shown that soil solarization is an effective and economical alternative to methyl bromide fumigation for strawberry fields in the San Joaquin Valley. Mr. Thao used soil solarization as an alternative to methyl bromide in 1997 and again in 1998. Only three growers attended the field day, however. Other growers did not attend because they belong to the Highlander Cooperative and Mr. Thao belongs to Hmong America. The two organizations do not cooperate with each other. The February workshop was conducted at the Fresno County Cooperative Extension Office. At the workshop Carolyn Watson showed slides of the major pests and beneficials and then distributed hand lenses to the attendees and showed them how to identify mites on leaves that were brought in from a grower-participants field.

Objective 6

The majority of Fresno's Southeast Asian strawberry growers are either Mien or Hmong. English is a second language, thus much of agriculture's technical language is difficult to understand. In an effort to address the difficulty surrounding chemical use, a pictorially graphic bilingual fact sheet on Botrytis Rot and Mites was completed during the first year. The one page fact sheet has Botrytis information including pictures of chemical product logos and application do's and don'ts on one side and similar information on mites of the other. An emphasis will be placed on safe use of chemicals. The material will be developed in both languages. Plans include reviewing the old fact sheet, revise if necessary and then circulate to as many growers as possible. Success will be measured by tracking the fact sheet rate of distribution.

The two-spotted mite information sheet was revised and distributed to the growers. (App. E) The bilingual fact sheet on *Botrytis* rot was also revised. (App. F-G)

Objective 7

The Advisory Team will endeavor to demonstrate the economic value of IPM by tracking the costs of production and yields on comparative conventional and IPM plots. The challenge of the objective is not the setting up of the side-by-side plots but the tracking of the costs and yields. Record keeping has been and continues to be one of the greatest challenges faced by this English as a Second language culture.

The economic advantages of using soil solarization rather than methyl bromide fumigation were extensively discussed at the soil solarization workshop.

The financial management workshop was held at the new Small Farms Center located at 550 E. Shaw Ave. here in Fresno. The workshop was divided into two parts so that more information could be taught. Part one held April 22nd from 7 to 9:30 P.M. dealt with farm management and record keeping. On April 29th the workshop concluded with information on filing a loan application and a review of previous material. The workshop was able to accommodate 30 people.

Yield comparisons have not been a part of the project to date due to the lack of cooperation by the grower-participants with regard to yield data.

SUMMARY & CONCLUSIONS

The importance of the BISS project is highlighted by the fact that no previous formal field projects had been carried out with San Joaquin Valley Southeast Asian strawberry growers. As a result, the information developed in the BISS program is a first step toward introducing these growers to technical agriculture.

When the project first began growers did not want to participate, feeling it would cause a conflict between themselves and the packing sheds that they rely on to sell their crop. The first step in making the project work was to create a relationship between the project, the packing shed and the growers. Most of the first year of the project was devoted to this effort. Trust was developed within the Southeast Asian farm community through attendance at cultural activities and later at meetings attended by growers, packing shed representatives and the BISS advisory team. Cooperation between the packing shed PCAs (pest control advisors), growers and the BISS advisory team was very important because the growers would not allow anything to be done in their fields without approval by the packing shed.

The most important accomplishment of the first year was the establishment of trust between key leaders in the Southeast Asian community and the BISS advisory team. Other things accomplished in the first year included the introduction and release of predatory mites, which opened the door for further education. In the second year grower-participants increased to thirteen members and for the first time we were able to put together a project phone list thereby establishing a communication link between all project participants. (App. H)

The monthly meetings began as breakfast meetings at a local restaurant. Because attendance varied from one to twelve growers per meeting different formats were tried. The most successful of these formats was the establishment of meetings at a different grower-participant=s field every month. (App. I). Meeting announcements were made through the project newsletter *BISS in Brief* . (App. J, K, L) Also included in the newsletter were workshop announcements, pesticide label updates and topics that were to be discussed at the meeting.

Growers were eager to volunteer their fields and show off the practices they learned through the program. During these meetings hands-on training in mite sampling and other practices were taught and growers discussed concerns in their fields with advisory team members. At the monthly grower meetings each grower was offered the opportunity to schedule a comprehensive field evaluation with the advisory team. Four of the growers took advantage of this opportunity.

Field monitoring was conducted in all thirteen growers= fields during the second year of the BISS project. The growers were taught how to monitor and what to look for. The same monitoring process was used in all the fields. Graphs and charts were given and explained to all growers. (Fig. 1-26) Copies of all weekly field reports were given to members of the advisory team, the grower and the PCA representing the packinghouse each grower had contracted with to sell his crop. (App. A - D) All the information gathered was entered into a computerized database. *Botrytis* and two-spotted mite pressure was above average during the spring of 1998. Predatory mites were released in four of the BISS fields, thereby introducing the growers to their use.

The soil solarization workshop was held on July 8th at Touxia Thao's field. Mr. Thao is one of the grower-participants and a leader of the Hmong community. The field day focused on alternatives to methyl bromide. University of California research has shown that soil solarization is an effective and economical alternative to methyl bromide fumigation for strawberry fields in the San Joaquin Valley. Mr. Thao used soil solarization as an alternative to methyl bromide in 1997 and again in 1998.

The February workshop was conducted at the Fresno County Cooperative Extension Office. At the workshop Carolyn Watson showed slides of major pests and beneficial and then distributed hand lenses to the attendees and showed them how to identify mites on leaves that were brought in from a grower-participant-s field. (App. - N) Other information given out during the workshop included a new revised bilingual fact sheet on *Botrytis* Rot and an easy to read two-spotted mite information sheet. (App. E, F, G)

The financial management workshop was held at the new Small Farms Center located at 550 East Shaw Avenue in Fresno. The workshop was divided into two evening presentations so that more information could be covered. Part one was held April 22nd and dealt with farm management and record keeping. On April 29th the workshop concluded with information regarding how to apply for a loan and a review of previous material. The workshop was able to accommodate 30 people.

Yield comparisons have not been a part of the project to date due to the lack of cooperation by the grower-participants with regard to yield data.

This is a demonstration project with long-term needs. The group dealt with in this project is unique not only because of the culture of the participants, but also because it involves farming in an urban area. Southeast Asian growers have much to learn about the use of different fertilizers and their effect on groundwater, alternatives to methyl bromide such as soil solarization, and the reduction of pesticide use on the urban farms they have created.

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BISS

Pest Management Report

Grower Howard Yang **Date** 2-18-99

Location Herndon / Fowler **Sampler** CW, TV

☐ Citrus ☐ Grapes ☐ Almonds ☒ Strawberry

Species Sampled	2 spotted mites	
Sample Method	per leaf	
Block		
Blk. Plastic North	.05	few eggs
Blk Plastic South	0	
Clear Plastic (Methyl Bromide)	0	

Comments ☐ See attached recommendation

Howard would like to apply a miticide in about 2 weeks.

App. A

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Pest Management Report

Grower Ricky Cha **Date** 3-19-99

Location Gettysburg / Clovis **Sampler** CW

☐ Citrus ☐ Grapes ☐ Almonds ☒ Strawberry

Species Sampled	% Bloom	2-spotted mites
Sample Method		Per leaf
Block		
Black Plastic	Trace	.59

Clear plastic plants showing more bloom than black plastic plants

Comments ☐ See attached recommendation

Rain predicted for this weekend.

Not enough bloom to worry about spraying

App. B

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BISS

Pest Management Report

Grower Cha Fong Yang **Date** 3-5-99

Location Belmont/Clovis **Sampler** CW

☐ Citrus ☐ Grapes ☐ Almonds ☒ Strawberry

Species Sampled	% Bloom	2spotted mite Per leaf	Beneficial Thrips (good bug) Per leaf
Sample Method			
Block			
Clear plastic	0-Trace	.04	0
Black plastic	0-Trace	.72	.06

Other good bugs seen in field are lacewing eggs & larvae. Hopefully they will control the mites.

Comments ☐ See attached recommendation

Call me about a field meeting in March. 25th
Carolyn 281-2118

App. C

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Pest Management Report

Grower Phen Vue **Date** 3-4-99

Location Kingsburg/Peach **Sampler** CW, TV

☐ Citrus ☐ Grapes ☐ Almonds ☒ Strawberry

Species Sampled	% Bloom	2 spotted mites	Beneficial thrips = good bug
Sample Method		Per leaf	Per leaf
Block			
	Trace	.06	.12

Plant growth not uniform

Comments ☐ See attached recommendation

No pest problems.

App. D

Twospotted Spider Mite

Description: The twospotted spider mite can be found on the undersides of strawberry leaves. They are so tiny they can only be seen with a hand lens. Mites are yellowish-green with 2 dark blotches on their bodies. The eggs are tiny, clear, and round shaped. They look like water drops.

Damage: The spider mite reduces fruit size and yield by sucking juices from the plant. Heavy populations result in webbing, leaf burn and death of the plant. The healthier the plant is, the less damage caused by mite infestations.

Management: During winter, spider mites live on nearby weeds and in the crowns of strawberry plants. They are spread from place to place by wind and as temperatures warm they begin laying eggs. Mites thrive and reproduce the fastest in temperatures of 60 -70 degrees.

Monitoring: Mite sampling should begin in February or as soon as the temperatures begin to warm up. Begin by picking 25 to 50 leaves from the base of the plants as you walk a diagonal across the field. Using a hand lens count the number of mites you see on each leaf. If you had mites in certain spots the year before that's where you should begin your search. You should sample the leaves at least once a week. When you get 5 to 10 mites per leaf you need to consider treatment. 5-10 mites per leaf is equal to 100 to 300 mites counted during your sampling.

Treatment: Miticides (ex. kelthane) or a light weight oil early in the season are the most often used controls. Predatory mites (good mites) may be released into the field to eat the twospotted mite. If you choose to release good bugs you must do it before your mite population is too high. Keeping your plants healthy will also lower the damage done by the spider mite. **Always talk to your PCA when you first notice mites in your field. The PCA will suggest control methods that suit your needs.**

App. E

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Pest Watch No. 1 Strawberries

Botrytis Rot In Strawberries

Botrytis Fruit Rot is the most serious disease on strawberry fruit in the S.J. Valley. It is caused by a fungus which is common in strawberry fields and is always present. Botrytis can cause either flowers to turn brown or result in fruit rot. Under wet and humid conditions, a gray-white coating is seen on infected fruit. Millions of spores ("seeds") are produced on each berry and can spread to adjacent plants in the fields. Rain and cool temperatures are ideal for the fungus to grow, sporulate and infect blossoms and fruit.

CONTROL:

(1) Removing infected fruit and dead leaves from the field reduces the number of spores .

(2) Using plastic mulches (clear, black, or other) prevents berry-soil contact, thus reducing the disease.

(3) Good air circulation helps; therefore do not set plants closer than the recommended spacing.

(4) Chemical control must be preventative **(before the disease).**

- the chemical fungicides must ideally be applied before infection starts
- applying the fungicide 24-48 hr. before a rain is **much better** than after.
- if a chemical fungicide cannot be sprayed within 24 hours after a rain it won't be very effective (< 20%).

- fungicides :

Thiophanate-m (Topsin M®)	Captan (Captan 50W®)
Iprodione (Rovral ®)	Thiram
Vinclozolin (Ronilan ®)	Benomyl (Benlate ®)

- Do not use the same chemical for consecutive sprays. Resistance has occurred with benomyl, iprodione, and vinclozolin. Alternating the chemicals or mixing two different chemicals aids in resistance management.

- Chemical registrations are constantly changing so always check the label

. . . . . .

[in English and Hmong languages]

Richard Molinar, Farm Advisor (UCCE)
Michael Yang, Field Assistant (UCCE)
Carolyn Watson (PCA)
Larry Whitted (BISS Project)

April 1999

App. F

(Hmong translation)

Txiv Pos Lwj Vim Cov Kabmob (Botrytis fruit rot)

Botrytis Fruit Rot: Yog ib cov kabmob tshwmsim rau cov txiv pos (strawberry) nyob rau hauv nroog S.J. Valley hauv no. Cov kabmob no tshwmsim tuaj vim yog huabcua hloov lawm, cov kabmob ib txwm muaj nyob hauv teb txiv strawberry. Cov botrytis no yuav ua rau cov paj lwj thiab zeeg tas. Nyob rau lub caij noo thiab muaj dej nag, nws yuav muaj ib txhia txiv lwj ua hmoov dawb lias, cov no yog ib cov noob kabmob. Cov (noob) no nws muaj ntau heev li, thiab nws tseem kis tau rau lwm tsob txiv nyob hauv thaj teb ntawv. Lub caij losnag thiab txias yog lub caij uas cov kabmob no sawv tuaj thiab cov noob yuav kis tau rau tsob txiv cov paj, tsis hais lub txiv liab los yog lub ntsuab yuav lwj taus tibsi.

Kev pab:

(1) Muab cov txiv lwj thiab cov nplooj uas lwj lawm de povtseg tawm hauv thaj teb kom cov kabmob tsawg.

(2) Yog siv cov ntaubyas kaj los yog cov ntaubyas dub thiab lwm yam los vov lawm kom cov txiv txhob chwv cov av, qhov no pab tau mentsis xwb.

(3) Ntawm tsob txiv pos ntawv yog muaj cua tuaj fiv nws yuav ib nyuag zoo zog; yog lino tsis txhob cog tsob txiv sib ti tshaj qhov uas luag kom cog.

(4) Siv tshuaj los pab tswj **uantej** thaum cov kabmob yuav tshwmsim tuaj

- Cov tshuaj (fungicides) no yuav tsum muab coj los siv tua rau uantej thaum cov txiv ntub nag thiaj tsis lwj.
- Siv cov tshuaj fungicides no uantej li 24 - 48hrs xojmoo yog thaum twg yuav los nag, yuav **zoo dua** twb losnag tas lawm es yus mam li siv.
- Yog tias tsis siv cov tshuaj no ua ntej 24hrs uantej thaum losnag, ces tom qab ntawv siv los yuav pab tsis tau pestsawg lawm, tsuas pab tau li 20% los yog tsawg dua.

•• **Cov Tshuaj Fungicides**:

Thiophanate (Topsin M®)	Captan (Captan 50 W®)
Iprodione (Rovral ®)	Thiram
Vinclozolin (Ronilan ®)	Benomyl (Benlate ®)

•Tsis txhob siv tib cov tshuaj qub xwb, yuav tsum siv cov tshuaj no sibhloov txhua zaus, cov kabmob thiaj li nce tsis taus tuaj. Rau qhov cov tshuaj li Benomyl, Iprodione, thiab Vinclozolin no cov kabmob yuav tiv taus yog tsis tias tsis hloov. Yuav tsum hloov siv ob peb hom tshuaj thiaj yuav pab tswj tau.

•Cov tshuaj coj los siv rau tej qoob luag ib sij hloov ib zaug, yus yuav tsum nyeem daim label kom tseeb

App. G

BISS Phone List

	FAX		HOME	MOBILE
Phen Vue			252-0762	250-1938
	485-4352	Office	485-6648	
Va Long Chang			255-6348	
Howard Yang			323-8417	
Vacha Yang			437-0728	
Richard Molinar	456-7575		456-7555	246-1915
Michael Yang				
Sharon Nance	252-5483		252-2191	
Larry Whitted	225-9161		225-8499	
Carolyn Watson	449-0830		449-0601	281-2118
Chu Yang			486-0348	
Ken Grimes			276-7494	
Yee Vang			291-3757	
Meng Fong Cha			323-9842	
Cher Xeng Thao			275-7906	
Gha & Tria Vang			348-0723	
May Sia Thao			221-6284	
Gary Foth	673-8307		673-5551	974-3850
Frank English	875-3179		966-4398	761-0571
Touxia Thao			323-5726	
Ricky Cha			875-0761	
Cha Fong Yang			255-3824	
J.R. Woods	358-4197		358-5643	
Thomas Vangyi			252-1750	

1-20-99

App. H

Monthly Field Meetings

App. I

January 1999
Number 3

Volume 3

BISS IN BRIEF

Morning Meeting

The first BISS field meeting will be held at **Howard Yangs'** field on **Thursday January 28th at 8:00AM**. The group will meet in front of the strawberry stand. Hot drinks and donuts will be provided by the advisory team. Howard's field is located at the northeast corner of Herndon and Fowler. It is important that growers attend to schedule soil tests in the fields prior to covering plants with plastic.

Thursday Meeting Topics

At Thursday's morning meeting we will be inspecting Howards plants for the presence of spider mites, especially the area covered by black plastic. Last year the areas covered by the black plastic seemed to have more mites than other areas in the fields. Growers will be taught how to inspect their fields. Soil tests for nitrogen will be done and growers present will be taught how to test their own soils for nitrogen needs. This is important as many growers will soon be preparing to cover the plants with plastic and now is an excellent time to apply broadcast fertilizer with the hope that the rain will send it to the plant roots. **Thursday mornings meeting** will be very brief. Growers present at the meeting may also set up appointments to have members of the advisory team visit their fields and deal with specific problems.

Did you know.....

Strawberries will be removed from the Ronilan crop list June 1999. That means you will no longer be allowed to use Ronilan as a fungicide for Botrytis after that date.

BISS FIELD MEETING

THURSDAY, JANUARY 28, 1999

Howard Yangs Field 8:00 AM

APP. J

February 1999
Number 4

Volume 4

BISS IN BRIEF

Morning Meeting

The February BISS field meeting will be held at **Cher Xeng Thaos'** field on **Thursday February 18th at 8:00AM**. The group will meet in front of the strawberry stand. Hot drinks and donuts will be provided by the advisory team. Cher Xeng's field is located at the northwest corner of Peach and Jensen. It is important that growers attend to schedule advisory team visits in their fields prior to March 31, 1999. BISS funding has been cut off as of that date and the current benifits of the project will no longer be available to the grower participants.

Thank You

Thank you to all the growers who attended the January meeting at Howard Yang's field. We looked for and found a few mites in the area covered by black plastic. Growers were taught how to test their own soils for nitrogen needs.

Thursday mornings meeting will be very brief. Growers present at the meeting will be given materials to do their own nitrogen soil tests. Appointments will be scheduled for advisory team field visits.

JUST A REMINDER.....

Strawberry Growers Meeting February 25th. Notices will be sent out.

BISS FIELD MEETING

THURSDAY, February 18, 1999

Cher Xeng Thao's Field 8:00 AM

Peach and Jensen Streets

App. K

March 1999 Volume 5
Number 5

BISS IN BRIEF

Morning Meeting

The March BISS field meeting will be held at **Va Long Changs'** field on **Thursday March 25th at 8:00AM**. The group will meet in front of the strawberry stand. Hot drinks and donuts will be provided by the advisory team. Va Long Changs' field is located on the south side of the road on Jensen between Armstrong and Temperance Avenues. This will be the **last BISS** morning meeting. We hope all growers will attend and discuss concerns.

Thank You

Thanks to all the growers who attended the February meeting at Cher Xengs Thaos' field. We looked for and found a few mites in the area covered by black plastic. We are finding mites early this year and some fields will need to be treated.

Thursday mornings meeting will be very brief. Growers present at the meeting will be able to discuss mite presence and possible treatments for their individual fields. Bloom has also started in many fields and strategies for rot control will be discussed.

Thank You

The BISS Advisory Team thanks all the growers who helped make the BISS program a success. They are Phen and Kay Vue, Va Long, Chang, Va Cha Yang, Yee Vang, Neng Fong Cha, Cher Xeng Thao, Gha & Tria Vang, May Sia & Kay Thao, Touxia Thao, Ricky Cha, Cha Fong Yang and the many interested growers who helped us in our project.

BISS FIELD MEETING

THURSDAY, March 25, 1999

Va Long Changs' Field 8:00 AM

Armstrong and Jensen Streets

App. L

February Workshop

App. M

San Joaquin Valley

Strawberry Growers Meeting

February 25 8:00 - 12:30
UC Cooperative Extension Office
1720 S. Maple Ave Fresno

AGENDA

8:00 - 8:05	**- Welcome** *Richard Molinar/Manuel Jimenez*
8:05 - 8:50	**- Integrated Strawberry Production Management for the Central Valley** *Dr. Kirk Larson UCCE Strawberry Specialist*
8:50 - 9:10	**- Strawberry Varieties for the Central Valley** *Maxwell Norton Farm Advisor (Merced), Richard Molinar Farm Advisor (Fresno)*
9:10 - 9:30	**- Methyl Bromide Alternative Research** *same as above*
9:30 - 9:55	**- Plastic Mulches** *Richard Molinar* **- 2-year plantings** *Maxwell Norton*
9:55 - 10:15	break
10:15 - 11:00	**- Are You In Compliance! Grower Guidelines, Field Sanitation!** *Frances Pabrua California Strawberry Commission*
11:00 - 11:15	**- What's New for 1999 - open forum**
11:15 - 12:30	**- Insect and Spider Mite Workshop** *Carolyn Watson (Larry Whitted Consulting*

3 hours continuing education applied - for PCA's and Growers
presented in English and Hmong
No Charge

Co-sponsors - **UC Cooperative Extension Fresno / Tulare**
California Strawberry Commission
Biologically Integrated Strawberry Systems Project (BISS)
Wawona Frozen Foods

FOR MORE INFORMATION -

Richard Molinar 456-7555 or Manuel Jimenez 733-6791

DOOR PRIZES.....DRAWINGS.....PEST MANAGEMENT GUIDELINE

1720 S. Maple Avenue • Fresno, CA 93702-4516 • Telephone (559) 456-7285 • Fax (559) 456-7575

APP. N

Loom Tiaj (San Joaquin Valley)

Rooj sib tham txog txiv strawberry

Ob HlisNtuj 25 8:00 - 12:30
UC Cooperative Extension Office
1720 S. Maple Ave Fresno
559-456-7555

AGENDA

8:00 - 8:05	**- Welcome** *Richard Molinar/Manuel Jimenez*
8:05 - 8:50	**- Integrated Strawberry Production Management for the Central Valley** *Dr. Kirk Larson UCCE Strawberry Specialist*
8:50 - 9:10	**- Strawberry Varieties for the Central Valley** *Maxwell Norton Farm Advisor (Merced), Richard Molinar Farm Advisor (Fresno)*
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11:15 - 12:30	**- Insect and Spider Mite Workshop** *Carolyn Watson (Larry Whitted Consulting*

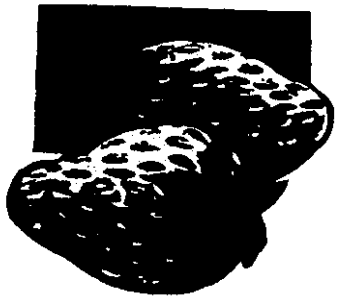
Tau 3 xoj moo (continuing education) rau cov tswv teb muaj ntawv siv tshuaj thiab cov PCA. Kuj yuav hais ua lus Hmoob thiab lus Askiv tib si Txhua yam yog dawb xwb, tsis tau them nqi

Cov tau txhawb yog - UC Cooperative Extension Fresno / Tulare
California Strawberry Commission
Biologically Integrated Strawberry Systems Project (BISS)
Wawona Frozen Foods

Muaj lus noog, los yog xav paub ntxiv thov hu rau -
Richard Molinar 456-7555 or Manuel Jimenez 733-6791

MUAJ KHOOM PUB.....MUAJ RHO HMOOV.....MUAJ NTAWV QHIA PUB DAWB

1720 S. Maple Avenue • Fresno, CA 93702-4516 • Telephone (559) 456-7285 • Fax (559) 456-7575



BISS:

BIOLOGICAL INTEGRATED STRAWBERRY SYSTEM

FARMER'S PORTFOLIO CONTAIN

- *BISS MITE SURVEY CHART*
- *BISS SOIL SURVEY CHART*
- *DANR ANALYTICAL LABORATORY*
- *SOIL INTERPRETATION GUIDE*

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SALINITY, SODIUM & FERTILITY ASSAY
SOIL INTERPRETATION GUIDE

Soil analyses provide information on a soil's nutrient-supplying ability, its salinity, acidity or alkalinity. This information coupled with the field's crop history, water supply and the general level of management are used in making fertilizer and amendment recommendations. The following information is based upon correlation studies conducted under California conditions by university and government researchers.

SP SATURATION PERCENTAGE is the grams of water required to saturate 100 grams of soil. Its relation to soil texture is as follows:

Below 20	Sandy or Loamy Sand
20 - 35	Sandy Loam
35 - 50	Loam or Silt Loam
50 - 65	Clay Loam
65 -150	Clay
Above 150	Usually (Peat or Muck)

The water-holding capacity of a soil when irrigated and allowed to drain is approximately half the SP. About half the water-holding capacity is available for crop use.

pH_s DEGREE OF ACIDITY OR ALKALINITY of a soil paste wet to saturation is expressed as pH_s.

Below 4.2	Too acid for most crops.
4.2 - 5.5	Adapted to growth of acid tolerant crops.
5.5 - 8.4	Adapted to growth of most crops.
Above 8.4	Possible sodium problem. However, sodium problems can occur below pH_s 8.4.

EC_e ELECTRICAL CONDUCTIVITY of the saturation extract can be expressed as millimnos per centimeter or decisiemens per meter at 25°C is an index of salt content. Salt will restrict crop growth as follows:

Below 2	No salinity problem for most crops.
2 - 4	Restricts growth of very salt sensitive crops.
4 - 8	Restricts growth of all but salt-tolerant crops.
8 - 16	Restricts growth of all but salt-tolerant crops.
Above 16	Only a few salt-tolerant crops make satisfactory yields.

Ca + Mg CALCIUM + MAGNESIUM ions in the saturation extract are expressed in milliequivalents per liter. Ca + Mg along with Na is used to calculate ESP.

Na SODIUM in the saturation extract expressed as milliequivalents per liter is used to calculate ESP.

Cl CHLORIDE in the saturation extract is expressed in milliequivalents per liter. For most crops, chloride is not a factor when the electrical conductivity is in a safe range.

ESP EXCHANGEABLE SODIUM PERCENTAGE is the degree to which the soil exchange complex is saturated with sodium. It is used to determine the soil permeability and potential crop phytotoxicity.

Below 10	No permeability problem; however, sodium-sensitive crops may show phytotoxicity such as chlorosis or slight crop yield reduction.
10 - 15	Soils with SP above 50 may have permeability problems and/or phytotoxicity.
Above 15	Permeability problems are likely on all mineral soils except those with a SP below 20. Most crops show phytotoxicity.

GR GYPSUM REQUIREMENT is the amount of gypsum or its equivalent required to furnish sufficient calcium to correct a sodium-caused permeability problem and/or phytotoxicity. GR is expressed in tons of 100% gypsum per acre-six inches of soil. It will be determined when the ESP is above 10, Ca + Mg is less than three times the EC_e or pH_s is above 8.4.

LIME LIME when reported by one to four pluses (+) indicates that acid-forming amendments such as sulfur or sulfuric acid may be used in place of gypsum. The number of pluses is an estimate of the amount of lime present. Acidifying amendments may cause excessive pH reductions if used in the absence of lime.

A numeric value is reported when pH_s is below 6.0 which indicates the amount of 100% lime ($CaCO_3$ in pounds per acre-six inch) required to adjust pH_s to 6.0.

B BORON, expressed as ppm in the saturation extract, is required for plant growth but may be toxic. This analysis is used to evaluate toxicity; for deficiencies, a different soil or tissue test is necessary.

Below 0.5	Not toxic for crops but may be insufficient for some.
Above 1	Sensitive crops may show visible injury.
5	Semi-tolerant crops may show visible injury.
10	Tolerant crops may show visible injury.

App. P

Ricky Cha

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/9/98	0	0	0
1/22/98	0	0	0
3/27/98	0	0	0
4/10/98	0	0	0
5/8/98	0.67	0	0.06
5/22/98	3.16	0	0.36
6/19/98	0	0	0

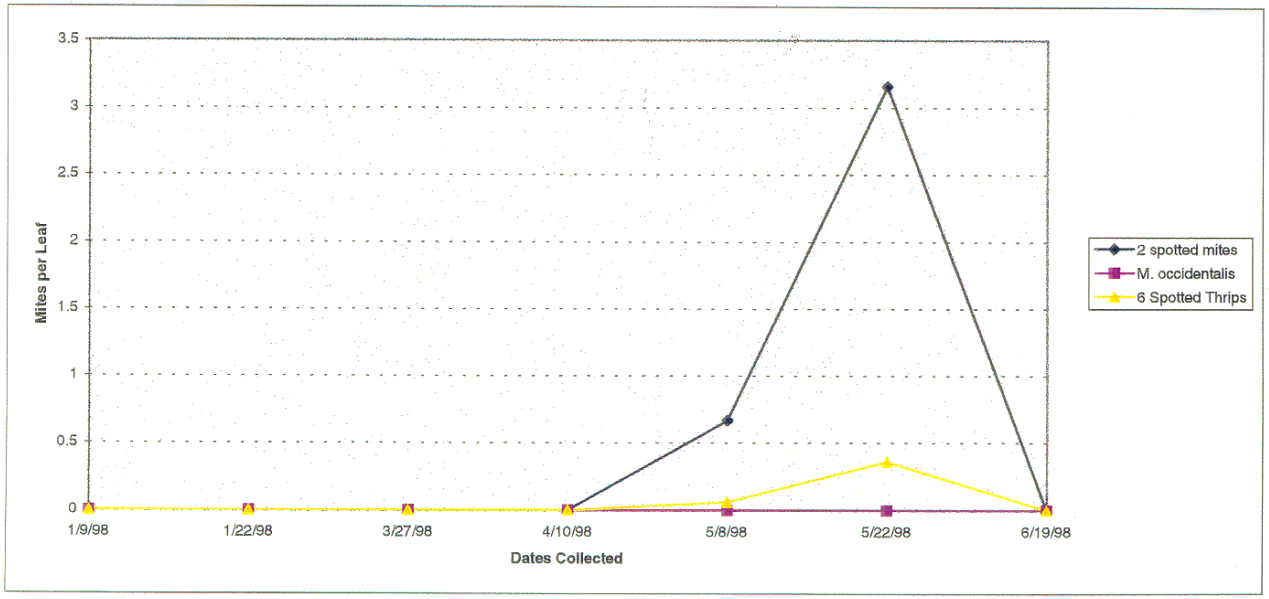


 Figure 1

Phen Vue

BISS MITE SURVEY

Date	2 spotted mites	Predatory Mites	6 Spotted Thrips
1/22/98	0	0	0
3/13/98	0	0	0
3/27/98	0	0	0
4/10/98	0	0	0
5/8/98	0	0	0
5/15/98	2	0	0
5/17/98	7.8	0.04	0
5/22/98	11.8	0.32	0.08
5/29/98	12.33	3.2	0

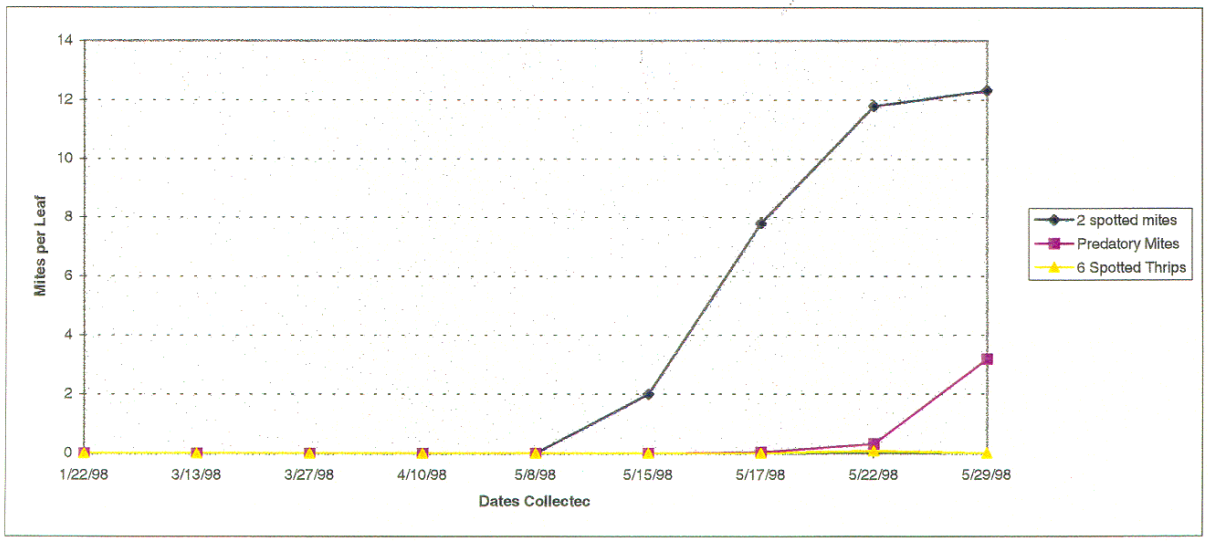


 Figure 2

Neng Fong Cha **BISS MITE SURVEY**

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/17/98	0	0	0
5/8/98	1.33	0	0
5/15/98	6.78	0	0
5/22/98	6.46	0.2	0.4
5/29/98	1.4	0.52	0.08
6/5/98	0	0	0
6/19/98	7.8	1.4	0.06

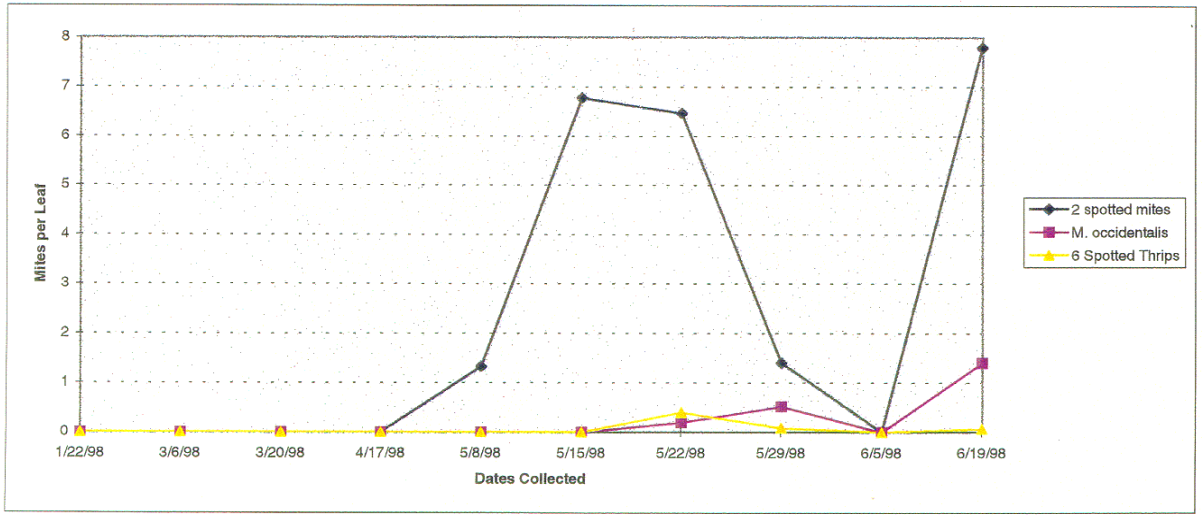


 Figure 3

Fong Cha Yang **BISS MITE SURVEY**

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/9/98	0	0	0
1/22/98	0	0	0
3/27/98	0	0	0
4/10/98	0	0	0
4/24/98	0.42	0	0
5/8/98	9.74	0	0
5/22/98	12	0	0
5/29/98	12.13	0.5	0
6/5/98	0	0	0
6/19/98	0	0	0

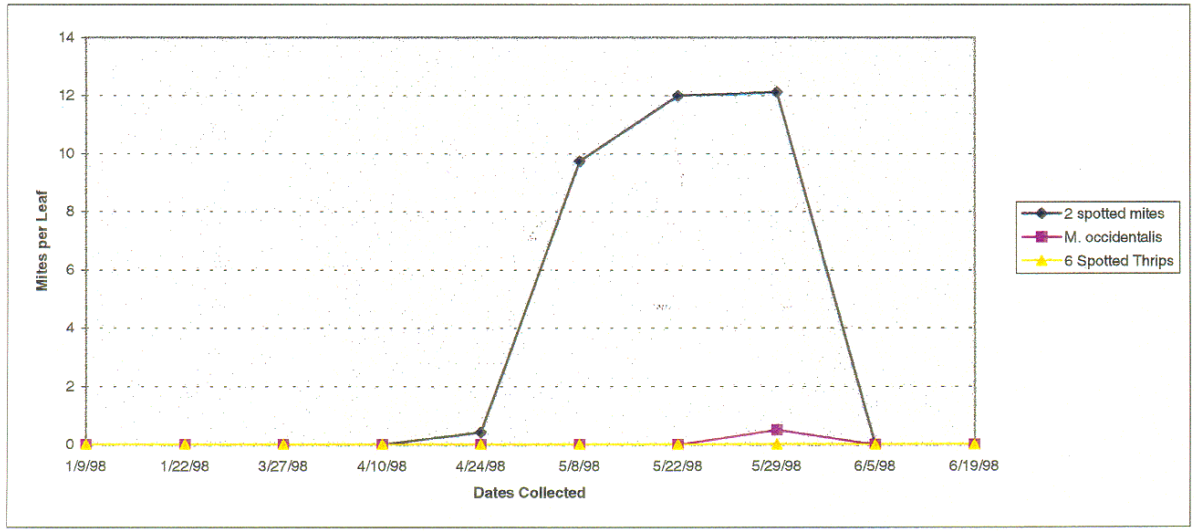


 Figure 4

Cher Xeng Thao **BISS MITE SURVEY**

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/3/98	0	0	0
4/17/98	0	0	0
5/1/98	1.44	0	0
5/8/98	2.76	0	0
5/15/98	9.96	0.48	0
5/22/98	4.7	0.5	0
5/29/98	1.9	0.8	0

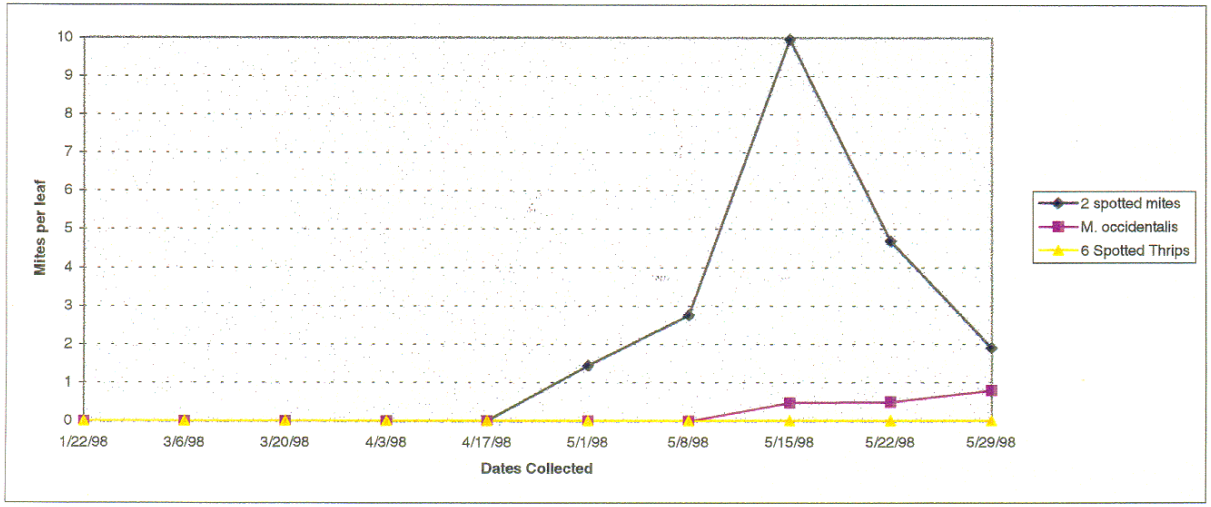


 Figure 5

Howard Yang

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/27/98	0	0	0
4/10/98	0	0	0
5/1/98	30	1	0
5/8/98	10	0	0
5/15/98	3.5	0	0
5/22/98	7.5	0.076	0.11
5/29/98	0	0	0
6/5/98	0	0	0
6/19/98	0	0	0

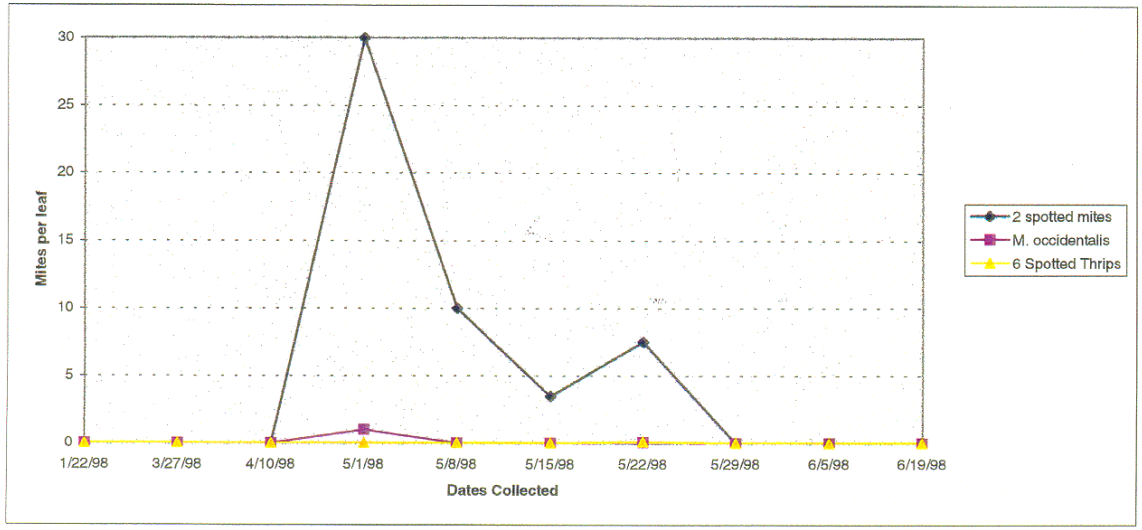


 Figure 6

May Sia Thao

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/3/98	0	0	0
4/17/98	0	0	0
5/15/98	0	0	0

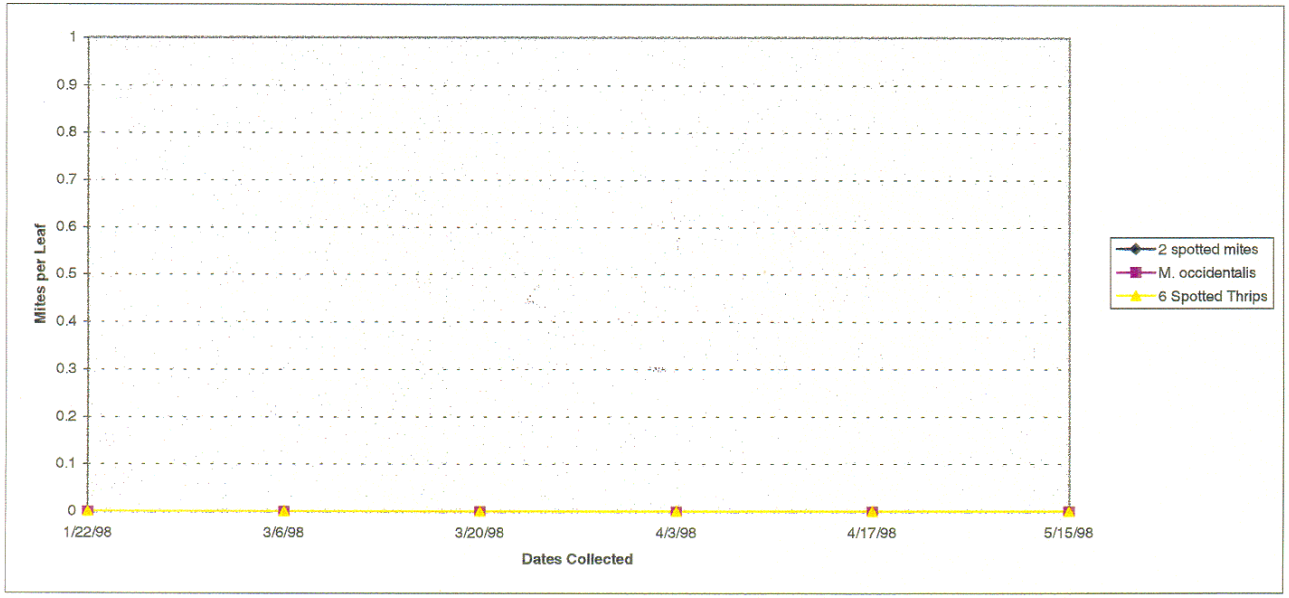


 Figure 7

Yee Vang

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/9/98	0	0	0
1/22/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/3/98	0	0	0
4/17/98	0	0	0
5/1/98	0.16	0	0
5/15/98	0.18	0.04	0

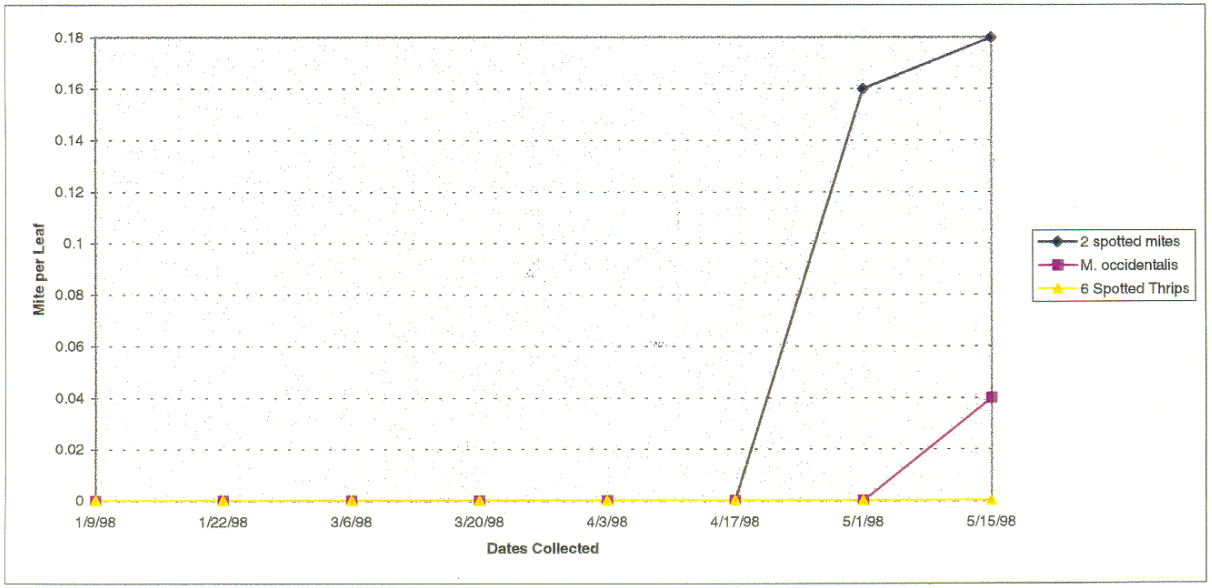


 Figure 8

Valong Chang

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/9/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/3/98	0	0	0
4/17/98	0	0	0
5/1/98	0.82	0	0
5/8/98	0	0	0
5/15/98	1	0	0.16
5/17/98	6.7	1.2	0
5/22/98	2.75	0.35	0
5/29/98	2.36	0.44	0.08

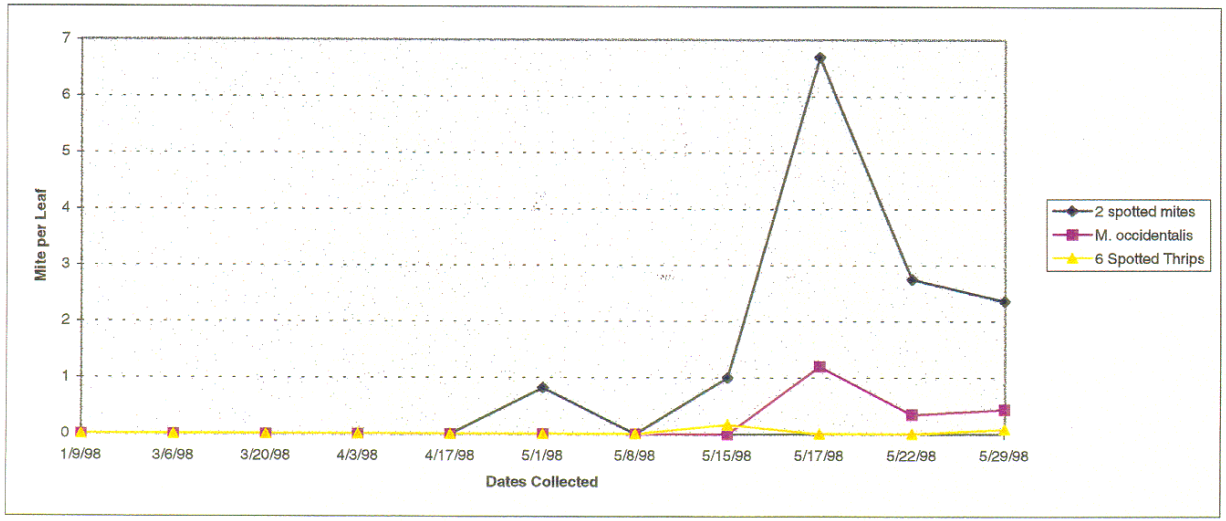


 Figure 9

Va Cha Yang

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/6/98	0	0	0
3/20/98	0	0	0
4/3/98	0	0	0
4/17/98	0	0	0
5/1/98	0.08	0	0
5/15/98	0.12	0	0
5/22/98	0.86	0	0.2
6/12/98	0	0	0

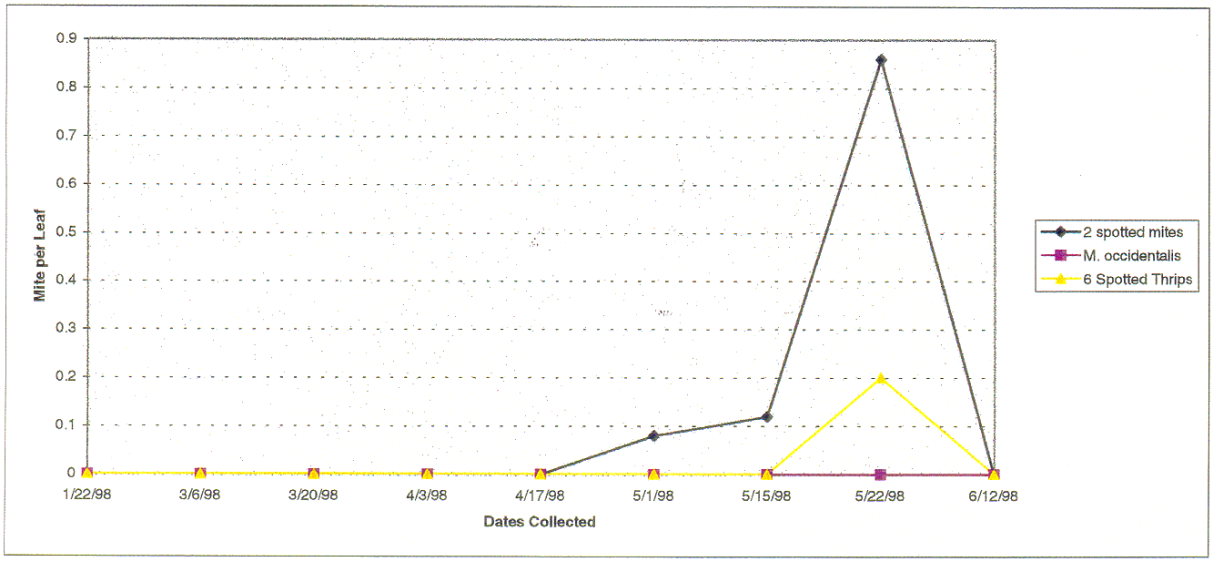


 Figure 10

Gha Vang/Tria Vang **BISS MITE SURVEY**

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/22/98	0	0	0
3/13/98	0	0	0
3/27/98	0	0	0
5/8/98	0.36	0	0.04
5/22/98	0.56		0.32
6/19/98	0	0	0

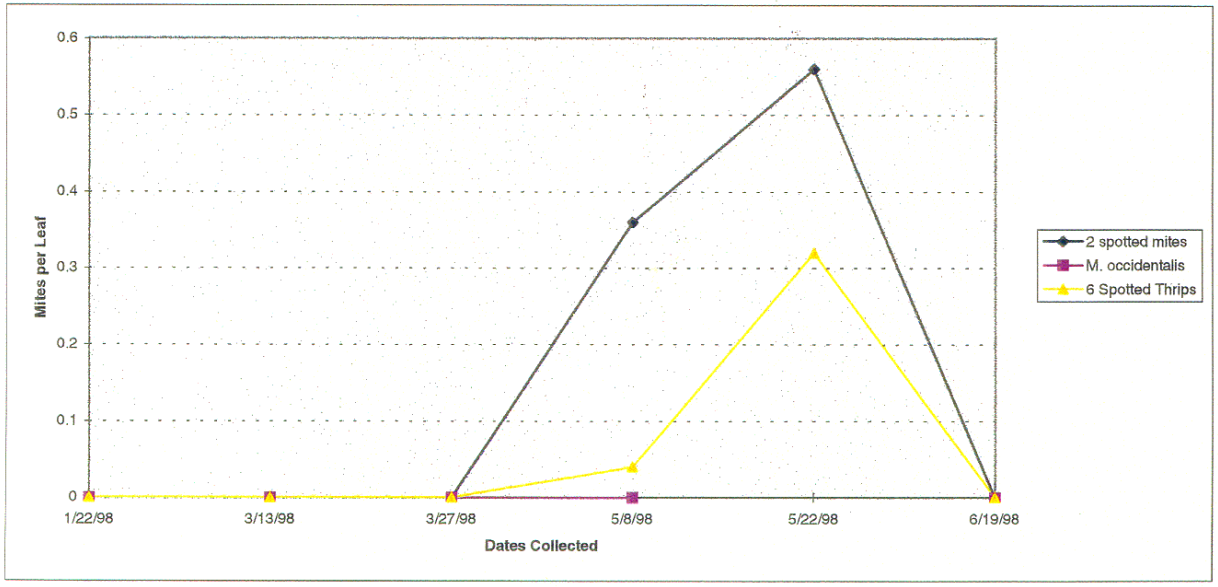


 Figure 11

Touxia Thao

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
1/9/98	0	0	0
1/22/98	0	0	0
3/27/98	0	0	0
4/10/98	0	0	0
5/8/98	1.33	0	0.04
5/29/98	2.16	0.23	0.05
6/5/98	0	0	0

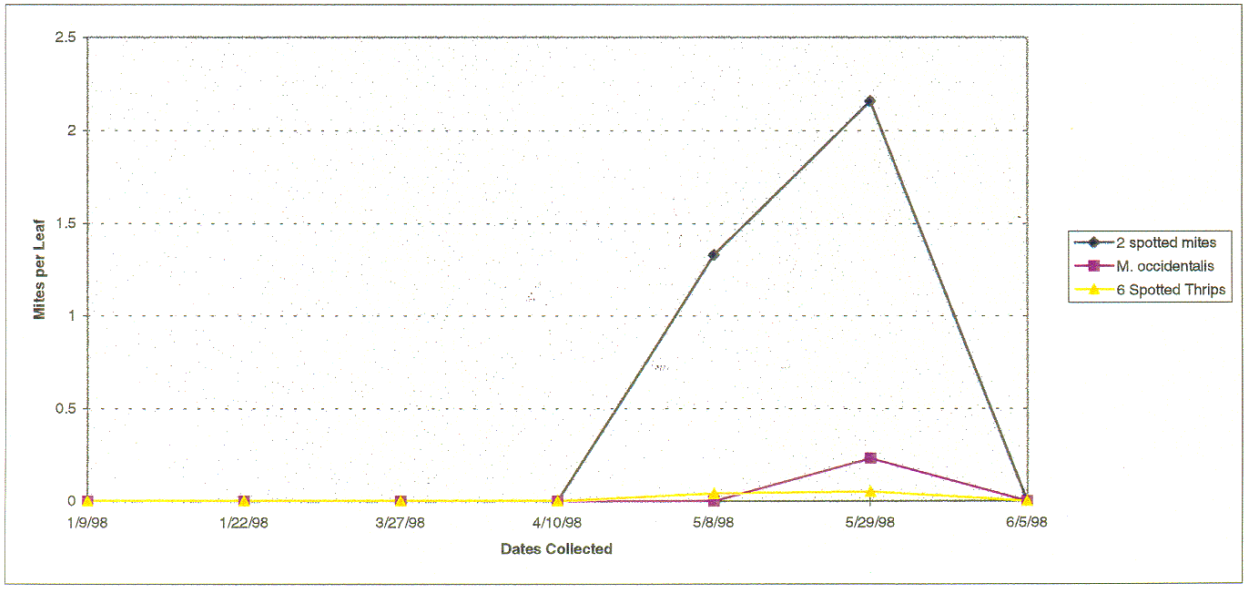


 Figure 12

Thomas Vangyi

BISS MITE SURVEY

Date	2 spotted mites	M. occidentalis	6 Spotted Thrips
3/27/98	0	0	0
4/10/98	0	0	0
5/8/98	0.2	0	0
5/22/98	0.5	0	0.14

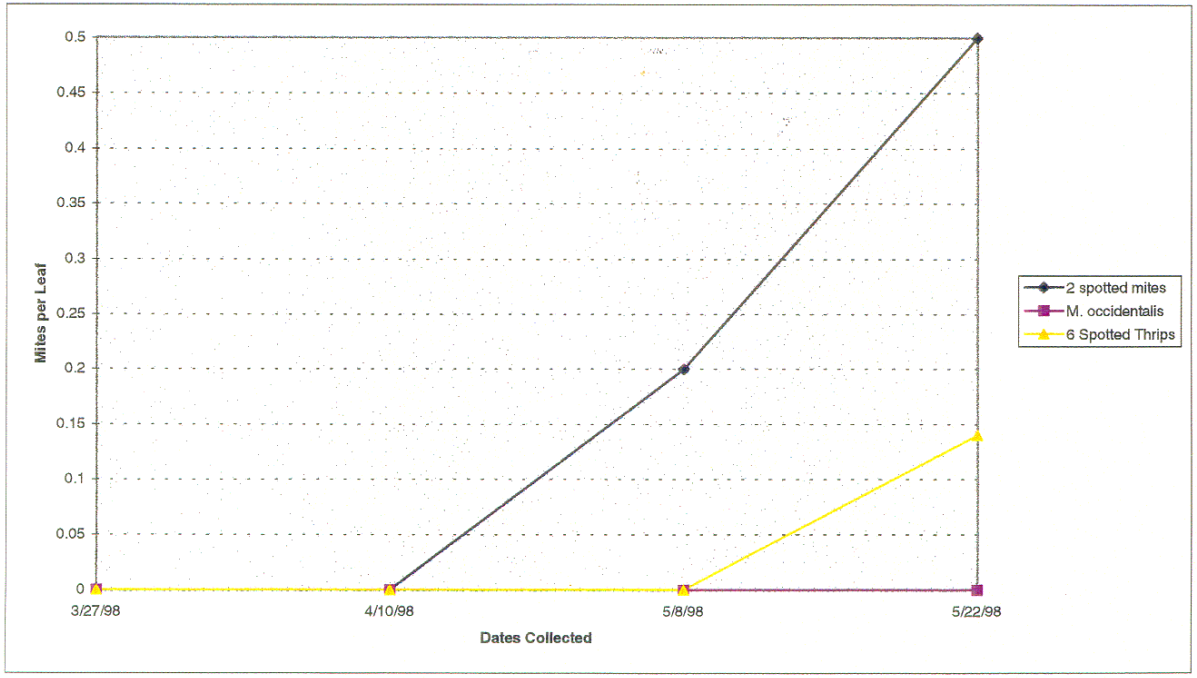


 Figure 13

Ricky Cha

BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	0
3/20/98	50
3/27/98	100
4/22/98	10
6/3/98	5

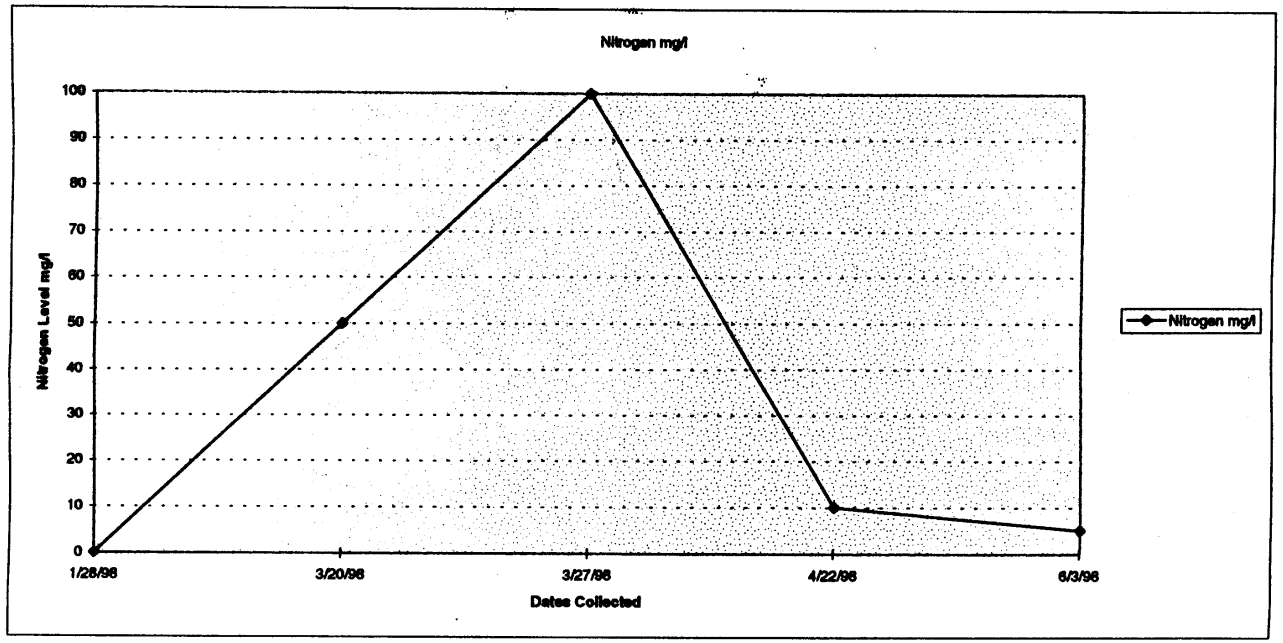


Figure 14

Phen Vue

BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	0
3/20/98	25
3/27/98	80
4/22/98	25
6/3/98	25
6/12/98	100

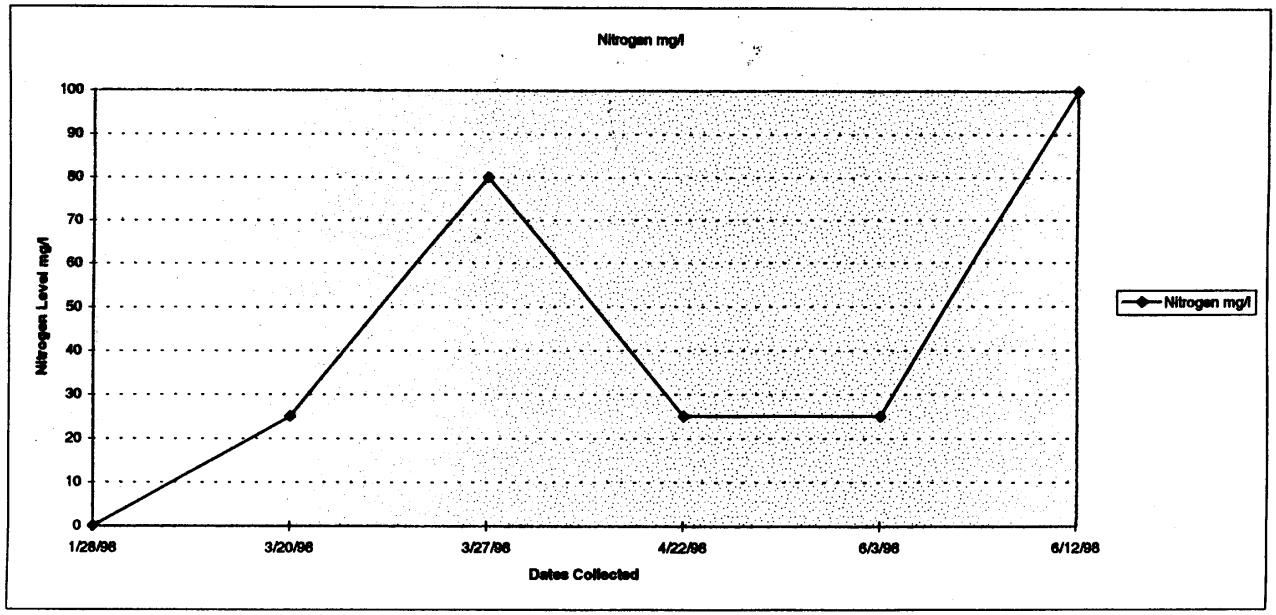


 Figure 15

Neng Fong Cha

BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	25
3/20/98	12.5
3/27/98	10
4/22/98	25
6/3/98	50

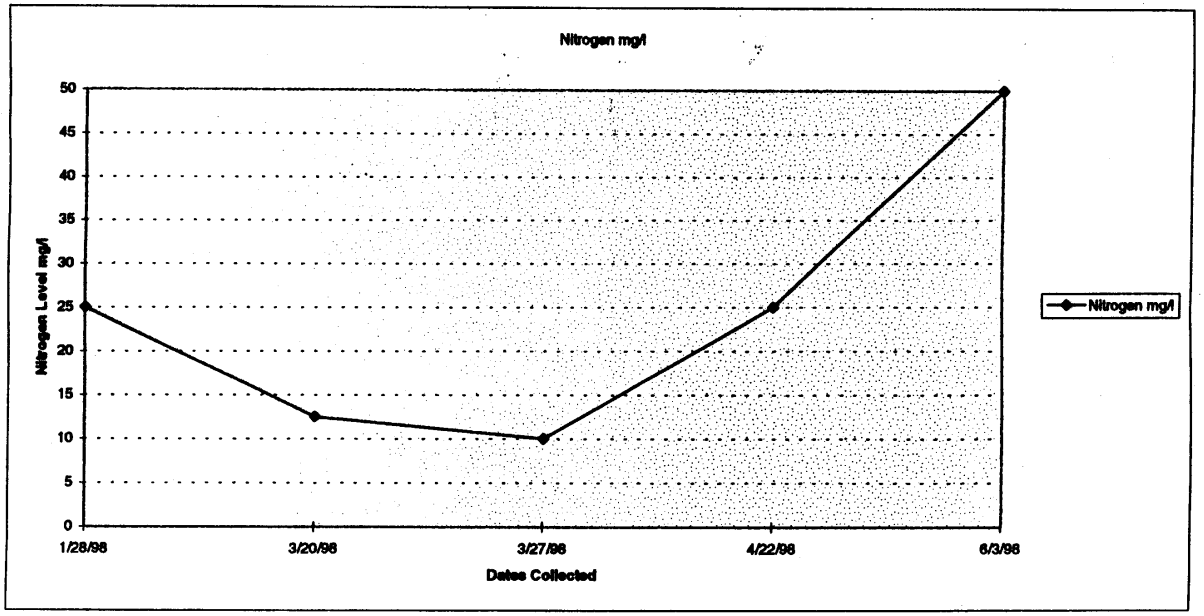


 Figure 16

Fong Cha Yang

BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	0
3/20/98	5
3/27/98	3
4/22/98	100
6/3/98	50

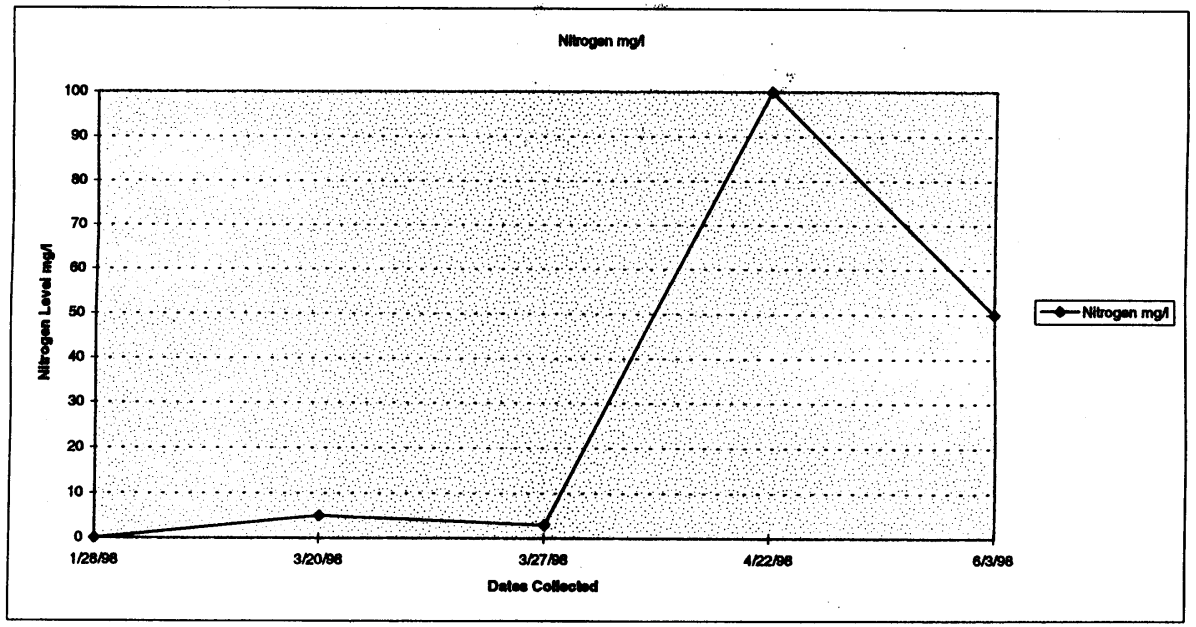


 Figure 17

Cher Xeng Thao BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	5
3/20/98	50
3/27/98	250
4/22/98	6
6/3/98	25
6/12/98	10

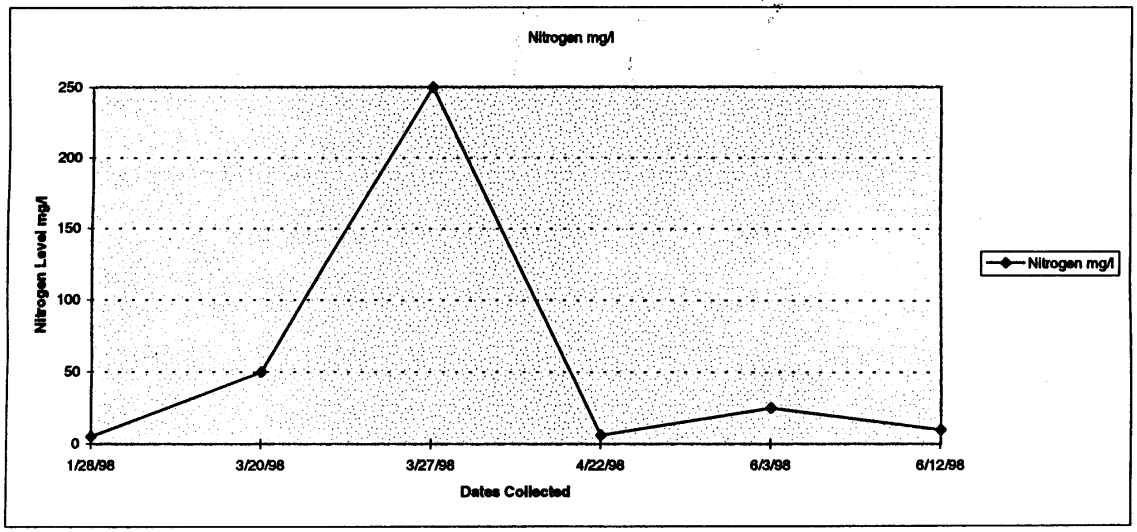


 Figure 18

Howard Yang **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/20/98	50
3/27/98	50
4/22/98	100
6/3/98	25

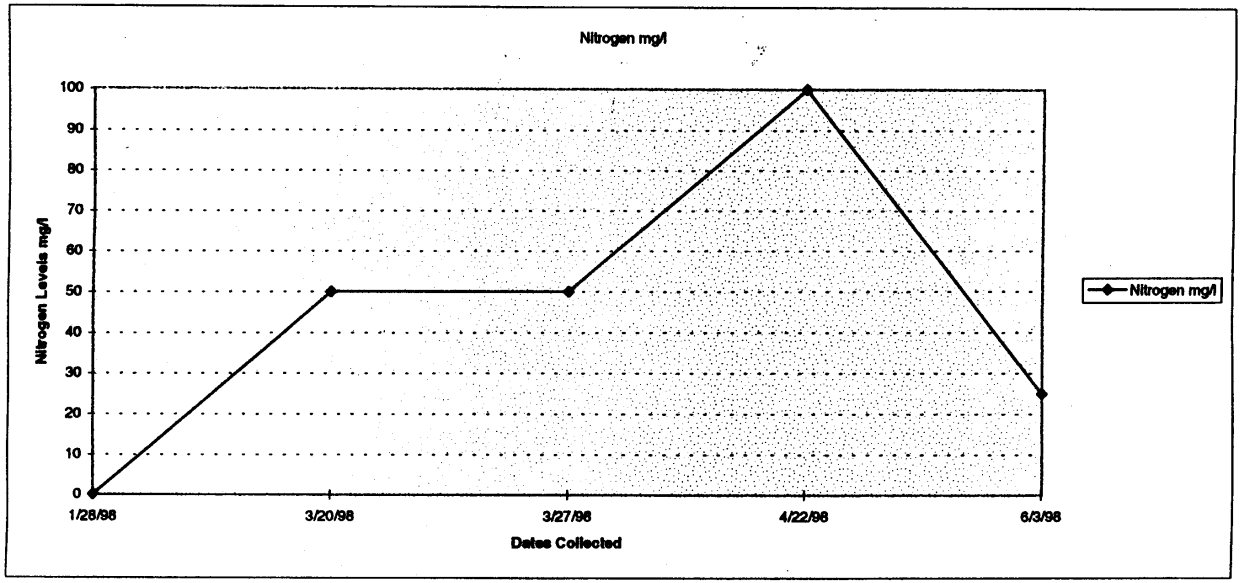


 Figure 19

May Sia Thao **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/27/98	30
3/20/98	50
4/22/98	15
6/3/98	25
6/12/98	10

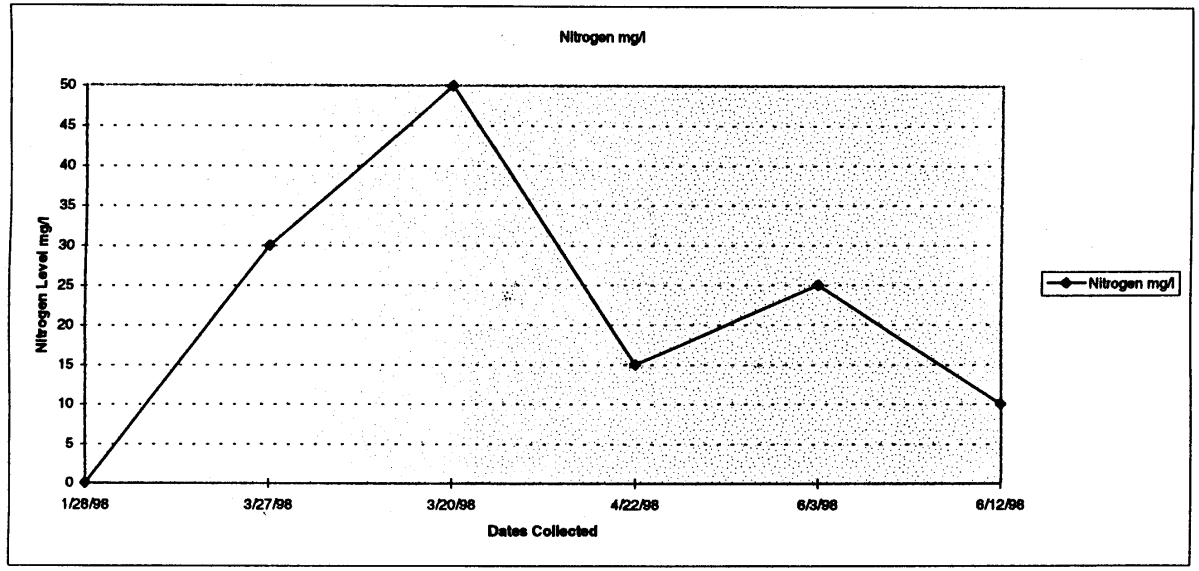


 Figure 20

Yee Vang

BISS SOIL SURVEY

Date	Nitrogen mg/l
1/28/98	0
3/20/98	0
3/27/98	0
4/22/98	5
6/3/98	0
6/12/98	10

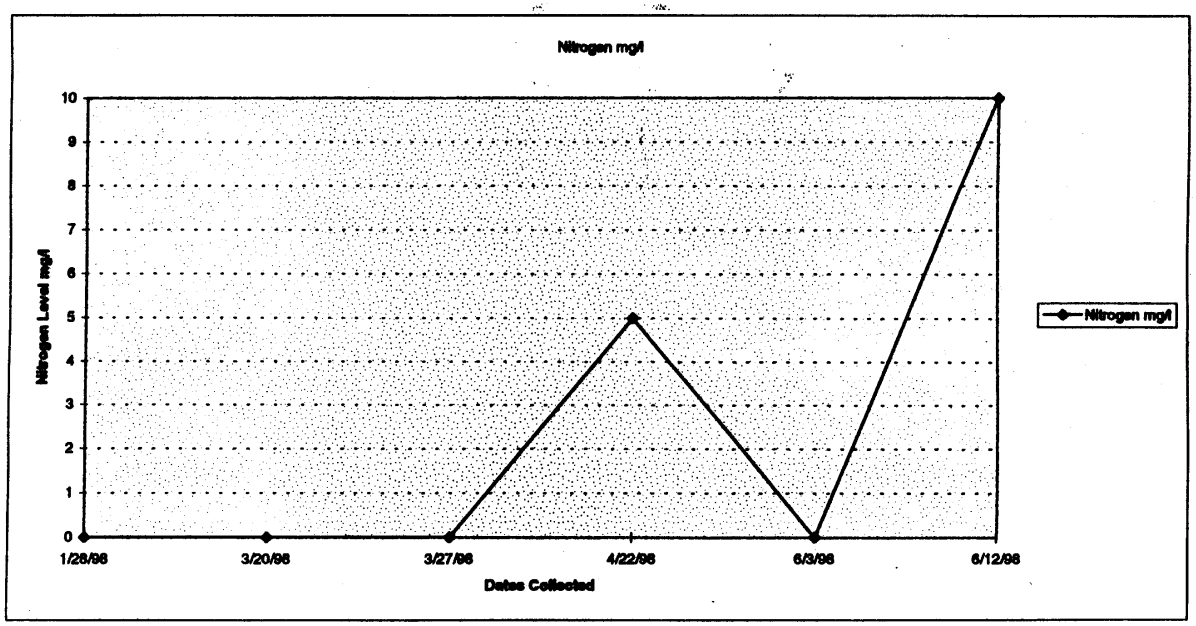


 Figure 21

Valong Chang **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/20/98	25
3/27/98	2
4/22/98	100
6/3/98	50
6/12/98	20

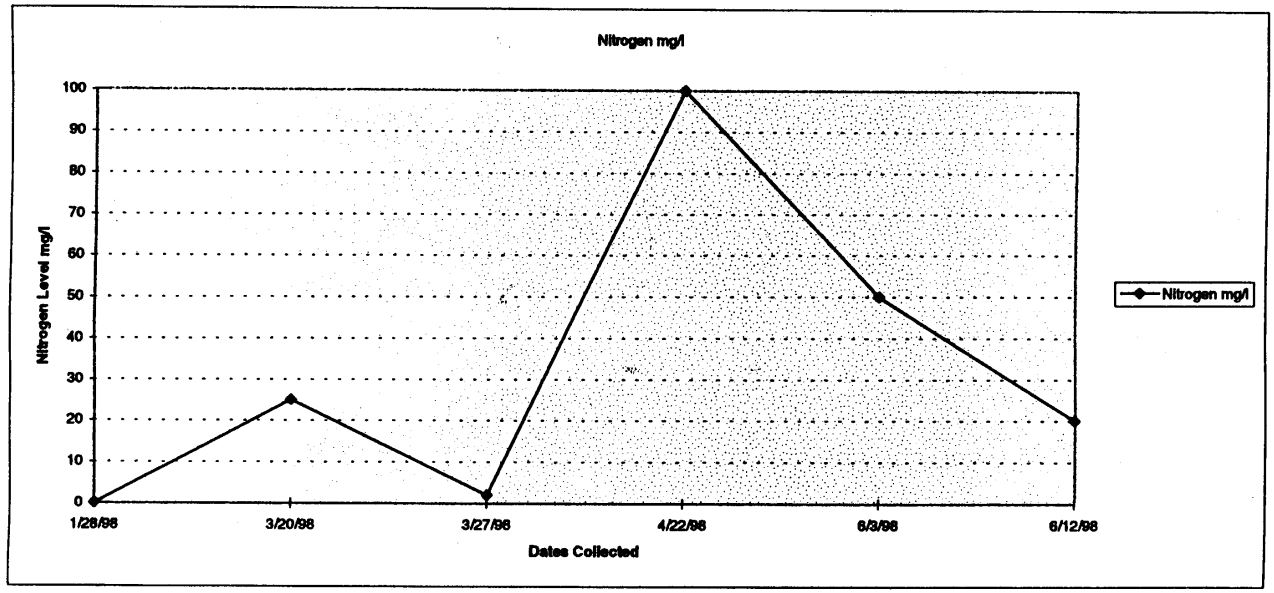


 Figure 22

Va Cha Yang **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/20/98	12.5
3/27/98	0
4/22/98	250
6/3/98	5

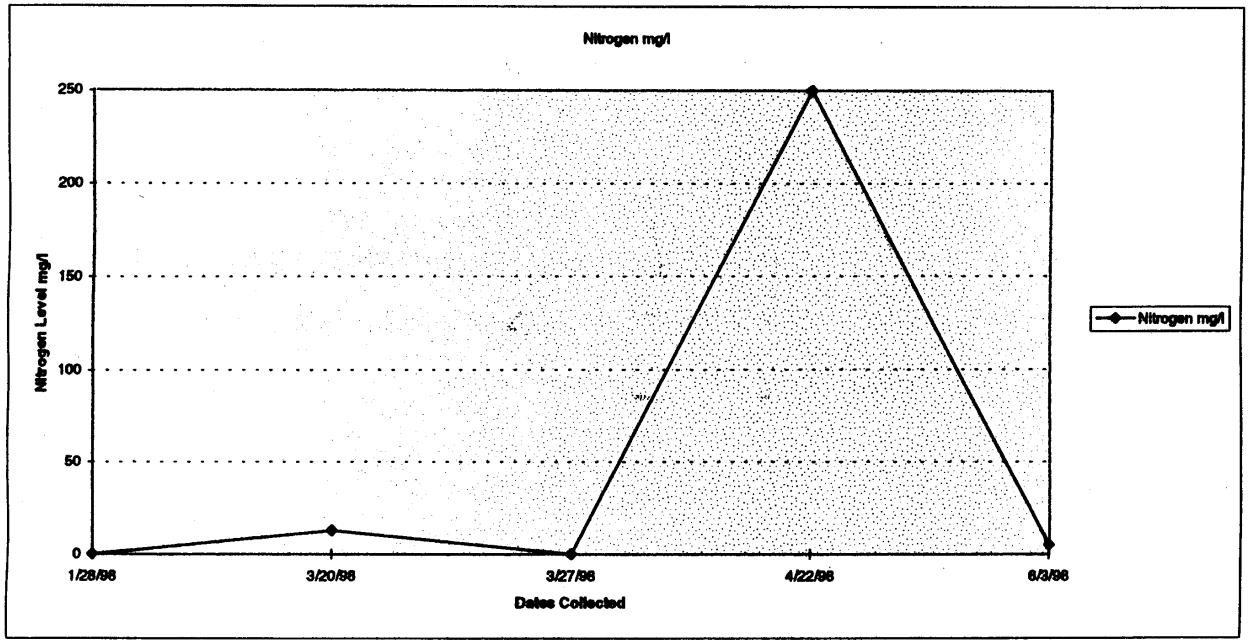
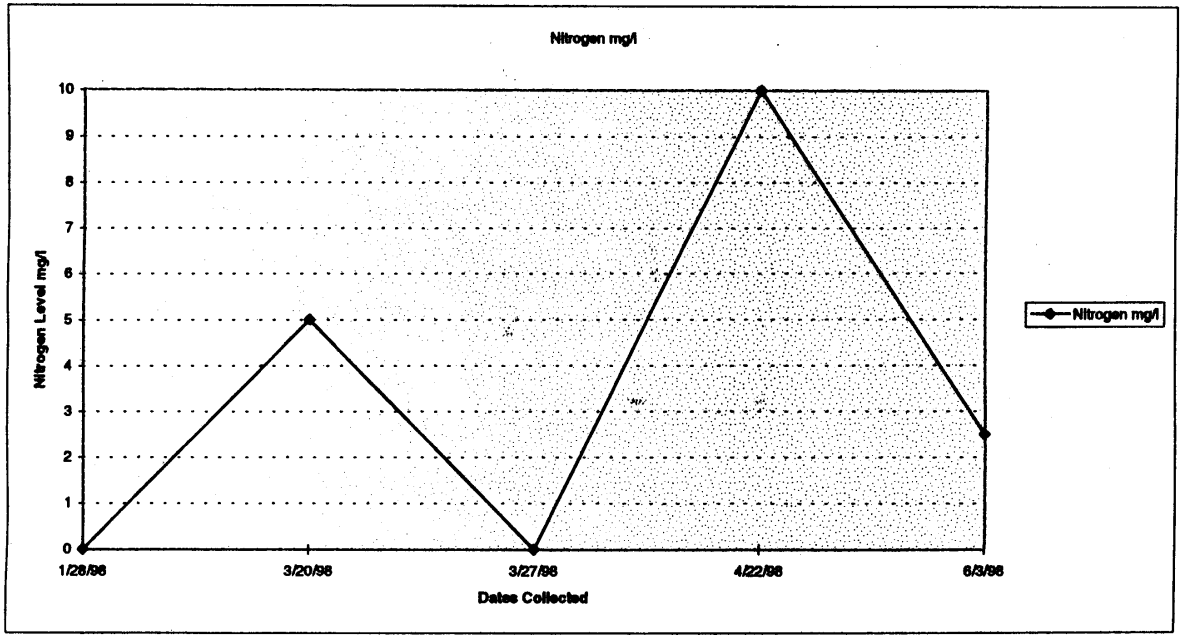


 Figure 23

Gha Vang/Tria Vang **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/20/98	5
3/27/98	0
4/22/98	10
6/3/98	2.5



Touxia Thao **BISS SOIL SURVEY**

Date	Nitrogen mg/l
1/28/98	0
3/20/98	0
3/27/98	0
4/22/98	100
6/3/98	5
6/12/98	15

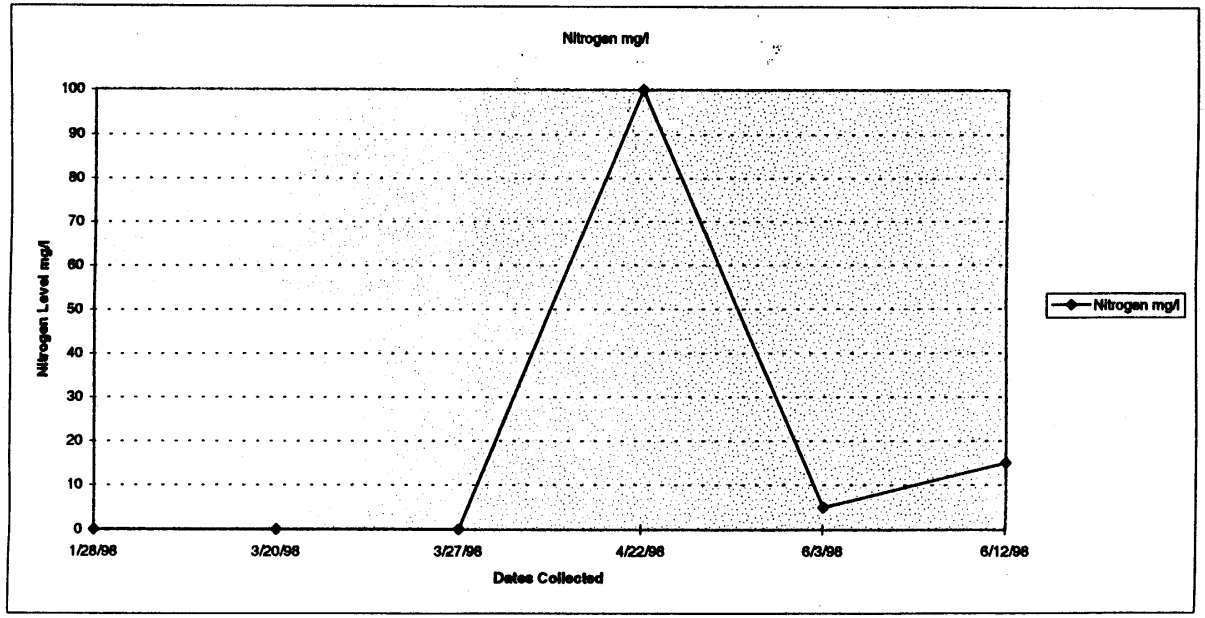


 Figure 25

DANR ANALYTICAL LABORATORY
UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION

SUBMITTED BY: MOLINAR, RICHARD
DANR SECTION: CRP: FRESNO
COPY TO:
COMMODITY: Strawberry Soil
DRY MATTER: As Received
4/22/98 Fresno "Soil Testing for Asian American Farmers"

WORK REQ #: 78S540
OF SAMPLES: 11
DATE RECEIVED: 05/26/98
DATE REPORTED 06/15/98
DANR CLIENT #: MOLR2R
TURN AROUND TIME IN WORKING DAYS: 15

SAMPLE #	DESC	SP %	pH	EC mmhos/cm	B ppm	P-Olsen ppm	X-K ppm	
1		21	6.7	0.68	0.1	14.0	52	Thao Mayska
2		21	7.9	0.90	0.1	12.9	73	thao cher Xiong
3		24	6.5	0.81	0.1	18.6	134	Phan Vue
4		20	7.3	1.18	0.1	15.5	51	Va Long Chang
5		21	7.1	0.29	0.1	4.1	73	Vang Yee
6		23	6.9	0.87	<0.1	6.7	33	Va Cha Yang
7		25	6.3	0.41	0.1	11.9	52	Vang Cha Tria
8		22	7.6	1.92	0.1	7.8	121	Meng Fong
9		23	6.8	1.23	0.1	21.2	50	Howard Yang
10		24	6.9	0.31	0.1	6.2	48	Ricki Cha
11		23	6.2	1.00	0.1	6.7	83	Cha Fong
Blank Concentration:		-	-	-	0	0	0	
% RPD:		-	0.0%	0.0%	0.0%	0.0%	0.0%	
Duplicate sample # 10:		-	6.9	0.31	0.1	6.2	48	
Standard Reference (Est):		-	8.2	0.33	0.4	39.3	1050	
Standard Reference (Actual):		-	8.2±0.2	0.33±0.03	0.3±0.1	39.1±4.0	1053±40	
Standard Reference ID's:		-	UCD 002	UCD 002	UCD 002	NORD	NORD	
IDEAL		20-35 sandy loam	5.5-6.8	1.0	.1-1	Above 20	Above 90	

Checked and Approved: E Sue [illegible]

The DANR Analytical Lab does not maintain a legal chain of custody and has not sought EPA approval.
Therefore, any results needed for legal purposes should be validated by a certified laboratory.

Make any rerun requests as soon as possible but before 7/15/1998. There is a charge for each rerun that results in a %RPD of 8% or less from original value.
For questions about your results or to request reruns, call the lab at (530) 752-0147.

The Laboratory Oversight Committee welcomes your comments by e-mail at oversite-danrlab@ucdavis.edu.

Samples for Work Request 78S540 will be discarded on 7/15/98. Make any requests for reruns as soon as possible by calling the lab at (530) 752-0147.

Table 1a.

MORE CHILLING NEWS

TOMAS OVALLE — THE FRESNO BEE

Tria Vang surveys some of his 8 acres of strawberries, at Shaw and Locan avenues in Fresno County, that were ruined by last weekend's freeze.